

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Original): A method of preparing the surface of an implant to be surgically implanted in living bone and made of titanium having a native oxide layer on the surface thereof, said method comprising the steps of

removing the native oxide layer from the implant surface to provide a surface that can be further treated to produce a substantially uniform surface texture, and

subjecting said surface from which the native oxide layer has been removed to a further and different treatment, before re-oxidation thereof, to form a substantially uniform surface texture.

Claims 2-28 (Cancelled)

Claim 29 (New): A method of preparing the surface of an implant to be surgically implanted in living bone and made of titanium, said implant having a surface with a native oxide layer thereon, said method comprising the steps of:

removing said native oxide layer from said surface;

acid etching said surface from which the native oxide layer has been removed to form a substantially uniform surface roughness; and

depositing a layer of hydroxyapatite on said acid-etched surface.

Claim 30 (New): The method of claim 29 wherein the depositing occurs in the absence of oxygen.

Claim 31 (New): The method of claim 29 wherein the depositing includes adhering, the adhering being enhanced by the roughness of the acid-etched surface.

Claim 32 (New): The method of claim 29 wherein the depositing includes applying hydroxyapatite in the form of fine particles.

Claim 33 (New): The method of claim 29 wherein the depositing includes applying hydroxyapatite in the form of a very thin film.

Claim 34 (New): The method of claim 29 wherein the depositing includes applying hydroxyapatite so as not to disturb the surface from which the native oxide layer has been removed to form a substantially uniform surface roughness.

Claim 35 (New): The method of claim 29 wherein the acid-etching includes producing a substantially uniform surface roughness with a substantially uniform array of irregularities formed by a plurality of substantially cone-shaped elements.

Claim 36 (New): The method of claim 35 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped on the cone-shaped elements.

Claim 37 (New): The method of claim 35 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped between the cone-shaped elements.

Claim 38 (New): The method of claim 29 wherein the depositing includes applying hydroxyapatite using an inert atmosphere.

Claim 39 (New): The method of claim 29 wherein the depositing includes distributing hydroxyapatite, the distributing being enhanced by the substantially uniform surface roughness.

Claim 40 (New): A method of preparing a surface of a device that is surgically implantable in living bone, said device being made of titanium and having a native oxide layer on said surface, said method comprising the steps of:

removing said native oxide layer from said surface of said device until the depth of the peak-to-peak oxygen profile as measured by Auger spectrometer has decreased to one-half of the initial profile;

after said removing, performing a roughening treatment on the surface resulting from said removing to produce a roughened surface with a substantially uniform array of irregularities; and

after said performing a roughening treatment on the surface depositing a layer of hydroxyapatite on the surface.

Claim 41 (New): The method of claim 40 wherein the performing a roughening treatment includes producing irregularities that include cone-shaped elements.

Claim 42 (New): The method of claim 41 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped on the cone-shaped elements.

Claim 43 (New): The method of claim 41 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped between the cone-shaped

elements.

Claim 44 (New): The method of claim 41 wherein the depositing includes applying hydroxyapatite in the form of fine particles that become entrapped on and between the cone-shaped elements.

Claim 45 (New): The method of claim 40 wherein the performing the roughening treatment includes acid etching.

Claim 46 (New): The method of claim 40 wherein the depositing occurs in the absence of oxygen.

Claim 47 (New): The method of claim 40 wherein the depositing includes applying hydroxyapatite in the form of fine particles.

Claim 48 (New): The method of claim 40 wherein the depositing includes applying hydroxapatite in the form of a very thin film.

Claim 49 (New): A titanium device to be surgically implanted in living bone, comprising:
a uniformly acid-etched exterior surface from which a native oxide layer had been substantially removed, said surface having a substantially uniform array of irregularities having base-to-peak heights of less than about 10 microns; and
a layer of hydroxyapatite located over said uniformly acid-etched exterior surface.

Claim 50 (New): The titanium device to be surgically implanted in living bone of claim 49

wherein the layer of hydroxapatite is located between the uniform array of irregularities.

Claim 51 (New): The titanium device to be surgically implanted in living bone of claim 49 wherein the layer of hydroxapatite is located on the uniform array of irregularities.

Claim 52 (New): The titanium device to be surgically implanted in living bone of claim 49 wherein the layer of hydroxapatite does not disturb the uniform array of irregularities of the surface.

Claim 53 (New): A titanium device to be surgically implanted in living bone, comprising:
a uniformly acid-etched exterior surface from which a native oxide layer had been substantially removed, said surface having a substantially uniform array of irregularities; and
a layer of hydroxyapatite located over said uniformly acid-etched exterior surface.

Claim 54 (New): The titanium device to be surgically implanted in living bone of claim 53 wherein the layer of hydroxapatite is located between the uniform array of irregularities.

Claim 55 (New): The titanium device to be surgically implanted in living bone of claim 53 wherein the layer of hydroxapatite is located on the uniform array of irregularities.

Claim 56. (New) The titanium device to be surgically implanted in living bone of claim 53 wherein the layer of hydroxapatite does not disturb the uniform array of irregularities of the surface.